Operational Considerations in Malaria Chemoprophylaxis for Military Personnel

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Major Factors

- ***Parasite***
  - **Epidemic vs. Endemic**
  - **Relapsing vs. Falciparum**
  - **Drug Resistance**

- ***Environment/host***
  - **Mission type (combat, peacekeeping, humanitarian assistance)**
  - **Troop population (flight crew vs. infantry)**
  - **Command climate (Attitude and Training/awareness)**
  - **Duration of exposure**
  - **Seasonality (relationship to rains)/Distribution**

- ***Medication***
  - **Tolerability (Side effects, reputation)**
  - **Dosing regimen (weekly vs. daily)**
  - **Consistency/complexity of policy guidance**

Epidemic vs. Endemic Malaria

- Epidemics caused by inserting large population of non-immune persons into transmission zone
  - Refugee and complex emergencies
  - Weather triggered epidemics i.e. floods
  - War and total medical system disruption

- Endemic malaria often not overt in adult population but converts to epidemic when soldiers inserted into situation

Relapsing vs. Falciparum Malaria

- **Relapsing malaria is primary military problem currently (>80% of total cases)**
  - **Eradication course either not taken or ineffective**
- **Falciparum malaria is greatest threat to life**
  - **Drug-resistant**
  - **Treatment drugs unfamiliar to most physicians**
  - **Complications can present very rapidly**

Drug Resistance

- **Vivax malaria insensitive to chloroquine**
  - **Limited in geographic scope so far**
  - **Primaquine “resistance” unclear due to lack of compliance**

- **Falciparum malaria shows resistance to nearly all drugs in some areas**
  - **Southeast Asia remains the worst area**
  - **Drug resistance often presents as an epidemic**

Type of Military Mission (Competing Health Threats)

- ***Combat***
  - **Most malaria exposure and least compliance occurs during combat operations**
- ***Peace-Keeping / Humanitarian Assistance***
  - **Low or absent threat of hostile action may permit more emphasis on disease and non-battle injury threat**
- ***Repeated Insertion & Extraction from Malarious Areas***
  - **Marine Expeditionary Unit**
  - **Special Forces**
  - **Strategic Lift Aircrew**
- ***Uninterrupted Occupation***
  - **Experience over years allows more accurate threat assessment**

Military Population

- Troops vary greatly in need for and response to requirement for prophylaxis
  - Regular infantry under discipline
  - Logistical, transportation, other support units scattered along the line of communications
  - Engineer units involved in tropical construction projects
  - Experienced troops often believe themselves above the need to take pills
  - Aviators

Command Climate

- **Attitude : Leadership/command emphasis is crucial in achieving compliance among troops**
- **Awareness: How do the troops perceive the malaria threat?**
- **Training: Have they actually practiced taking malaria medications in the past?**

Duration of Exposure

- **Malaria risk post deployment is cumulative**
  - **the longer the mission, the greater the malaria risk especially for relapsing malaria**
- **Long deployments almost always result in failing compliance with chemoprophylaxis**
  - **40% compliance after five months (daily med)**
- **Long deployments insure the men are exposed during the high malaria transmission season**

Malaria Seasonality/Distribution

- Even in Africa, malaria is seasonal
- Highest transmission typically follows the rainy season by several weeks
- Troops may be lulled into non-compliance if they don't see people getting sick during the low transmission season
- Focal ("patchy") geographical distribution of malaria complicates threat assessment

Tolerability of Medication

Perception is reality

- Troops generally don't like to take pills
- Single episode of vomiting/dizziness will stop some from ever taking that medication again
- Reputation of medication can achieve legendary status with troops: fame or infamy, regardless of merit
- Troops are usually well aware of adverse publicity
- Compliance with terminal prophylaxis is especially problematic
  - Command emphasis evaporates
  - Perception of disease threat wanes (and side effects may persist)

Medication Dosing Regimen

- **Short course medication for several weeks of protection would be highly desirable**
  - **Tafenoquine for 3 days protects for 10 weeks**
- **Daily medication (unsupervised) does not work**
  - **Daily doxycycline requires supervision**
- **Weekly regimen is generally superior to daily**
  - **Longer half-life allows missed dose to be “made up”**
  - **Command emphasis once weekly (“Malaria Monday”) is feasible**

Complexity of Chemoprophylaxis

- Simpler is better
- Single drug is a necessity; two drugs are easily confused or forgotten
- Medication administered before deployment for short exposures would be highly desirable
- Consistent policy among Joint and Combined forces is ideal

Ultimate Military Malaria Prophylaxis

- **Single dose medication or immunization administered during basic training that is 100% efficacious against malaria worldwide that has no adverse effects.**